

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 1. (Currently Amended) A method of transferring packets from
2 communication hardware to a host computing device, the method comprising:
3 receiving a set of packets at a communication interface;
4 in a ~~first~~hybrid buffer of a host computing device, writing a first type II
5 completion line configured to identify a first payload buffer in which payloads of
6 a first subset of the packets are stored, wherein the type II completion line
7 includes an address or index of a payload buffer and other information common to
8 the set of packets;
9 for each packet in the set of packets, writing a corresponding per-packet
10 type I completion line in the ~~first~~ hybrid buffer, wherein the type I completion line
11 includes information about a length of the packet, a length and a storage location
12 of a header for the packet, and other information useful for processing the packet;
13 after writing said per-packet type I completion lines, writing a ~~null~~type 0
14 completion line, wherein a type 0 completion line indicates that no more packets
15 are currently stored following the address or index indicated in the type II
16 completion line; and
17 signaling the host computing device that a set of packets ~~has been~~is ready
18 to be processed by configuring a single completion descriptor to identify the
19 hybrid buffer in which the completion lines were stored~~transferred~~; and
20 at the host computing device, reading the single completion descriptor and
21 accessing the identified hybrid buffers to process the packets.
22

1 2. (Currently Amended) The method of claim 1, further comprising:
2 in the first hybrid buffer, writing a second type II completion line
3 configured to identify a second payload buffer in which payloads of a second
4 subset of the packets are stored.

1 3. (Cancelled)

1 4. (Currently Amended) The method of claim 3, wherein said
2 completion descriptor comprises only said hybrid~~first~~ buffer identity.

1 5. (Cancelled)

1 6. (Currently Amended) The method of claim 5, wherein:
2 said first type II completion line further comprises a checksum type field
3 and a checksum start field; and
4 said checksum type field and said checksum start field apply to every
5 packet in the first subset of packets.

1 7. (Currently Amended) The method of claim 1, wherein said writing
2 a per-packet type I completion line comprises packing said per-packet completion
3 lines into the hybrid~~first~~ buffer.

1 8. (Currently Amended) The method of claim 7, further comprising:
2 packing headers of the packets into the hybrid~~first~~ buffer.

1 9. (Currently Amended) The method of claim 1, wherein each said
2 per-packet type I completion line comprises:
3 a length of a header of the corresponding packet; and

4 a length of a payload of the corresponding packet.

1 10. (Currently Amended) The method of claim 9, wherein each said
2 per-packet type I completion line further comprises:
3 an offset of the payload of the corresponding packet within a buffer in
4 which the payload is stored; and
5 a checksum of the corresponding packet.

1 11. (Original) The method of claim 1, wherein each packet in the set of
2 packets is part of the same communication connection.

1 12. (Currently Amended) The method of claim 1, further comprising at
2 the host computing device, after said signaling:
3 reading said per-packet type I completion lines until encountering said
4 type I ~~and~~ completion lines; and
5 using said per-packet type I completion lines to access headers and
6 payloads of the corresponding packets.

1 13. (Currently Amended) A computer readable medium storing
2 instructions that, when executed by a computer, cause the computer to perform a
3 method of transferring packets from communication hardware to a host computing
4 device, the method comprising:
5 receiving a set of packets at a communication interface;
6 in a ~~first~~ hybrid buffer of a host computing device, writing a first type II
7 completion line configured to identify a first payload buffer in which payloads of
8 a first subset of the packets are stored,
9 wherein the type II completion line includes an address or index of a
10 payload buffer and other information common to the set of packets;

11 for each packet in the set of packets, writing a corresponding per-packet
12 type I completion line in the hybrid -first-buffer, wherein the type I completion
13 line includes information about a length of the packet, a length and a storage of a
14 header for the packet, and other information useful for processing the packet;
15 after writing said per-packet completion lines, writing a ~~null~~type 0
16 completion line, wherein a type 0 completion line indicates that no more packets
17 are currently stored following the address or index indicated in the type II
18 completion line; and
19 signaling the host computing device that a set of packets is ready to be
20 processed by configuring a single completion descriptor to identify the hybrid
21 buffer in which the completion lines were stored; and
22 at the host computing device, reading the single completion descriptor and
23 accessing the identified hybrid buffers to process the packet.~~has been transferred.~~

1 14. (Currently Amended) A computer readable medium containing a
2 data structure configured for describing multiple packets to a host computing
3 device, the data structure comprising:
4 one or more headers of packets being transferred from communication
5 hardware to the host computing device; ~~and~~
6 for each of the packets, a corresponding per-packet type I completion line
7 stored in a hybrid buffer, wherein the type I completion line is configured to
8 identify:
9 a length of a header of the corresponding packet;
10 a length of a payload of the corresponding packet; and
11 information configured to identify a location of the payload;
12 a type 0 completion line, wherein a type 0 completion line is a null
13 completion line used to indicate no more packets are currently stored; and
14 a single completion descriptor configured to identify the hybrid buffer,

15 thereby facilitating the efficient transfer of the packets.

1 15. (Currently Amended) The computer readable medium of claim 14,
2 wherein each said per-packet type I completion line further comprises:
3 a checksum of the corresponding packet.

1 16. (Currently Amended) The computer readable medium of claim 14,
2 wherein said data structure further comprises a payload type II completion line
3 configured to identify a second data structure in which payloads of the packets are
4 stored.

1 17. (Currently Amended) The computer readable medium of claim 16,
2 wherein said information in said per-packet type I completion line comprises an
3 offset of the payload in the second data structure.

1 18. (Currently Amended) The computer readable medium of claim 16,
2 wherein:
3 said payload type II completion line further comprises a set of parameters
4 applicable to each of the packets; and
5 a first parameter in said set of parameters is configured to identify a
6 checksum type.

1 19. (Original) The computer readable medium of claim 14, wherein the
2 headers are stored in fixed-sized portions of the data structure.

1 20. (Currently Amended) A computing device, comprising:
2 a communication interface configured to transfer packets from a
3 communication link to the computing device;

4 software for operating the communication interface;
5 payload memory buffers for receiving payloads of packets transferred from
6 the communication interface;
7 hybrid ~~memory~~ buffers for receiving headers of the packets transferred
8 from the communication interface and completion lines configured to facilitate
9 processing of the packets by the software;
10 a ~~set of single~~ completion descriptors configured for the communication
11 interface to use to signal the software that one or more packets have been
12 transferred to the computing device;
13 wherein said completion lines in a first hybrid buffer include:
14 a payload type II completion line configured to identify a first
15 payload buffer in which payloads of one or more of the packets are stored,
16 wherein the type II completion line includes an address or index of a
17 payload buffer and other information common to the set of packets;
18 per-packet type I completion lines configured to identify locations
19 of the packets' payloads in the first payload buffer and locations of the
20 packets' headers in the first hybrid buffer, wherein the type I completion
21 line includes information about a length of the packet, a length and a
22 storage of a header for the packet, and other information useful for
23 processing the packet; and
24 a type 0 completion line, wherein a type 0 completion line
25 indicates that no more packets are currently stored following the address or
26 index indicated in the type II completion line.

1 21. (Currently Amended) The computing device of claim 20, wherein
2 said completion lines further include:
3 a ~~null~~ type 0 completion line, where in a type 0 completion line
4 indicat~~es~~ing that no more completion lines are stored in the hybrid buffer.

1 22. (Currently Amended) The computing device of claim 20, wherein a
2 ~~single~~first completion descriptor used by the communication interface to signal
3 the transfer of a first set of packets is configured by the communication interface
4 to include only the identity of the hybrid buffer in which headers of the first set of
5 packets are stored.

1 23. (Currently Amended) The computing device of claim 20, wherein:
2 said payload type II completion line further comprises a set of parameters
3 common to the one or more packets; and
4 the set of parameters comprises a checksum type.

1 24. (Currently Amended) The computing device of claim 20, wherein
2 each said per-packet type I completion line corresponds to one packet and
3 comprises:
4 a length of a header of the corresponding packet; and
5 a length of the payload of the corresponding packet.

1 25. (Currently Amended) The computing device of claim 24, wherein
2 each said per-packet type I completion line further comprises one or more of:
3 an offset of the payload in the first payload buffer; and
4 an offset of the header in the first hybrid buffer.

1 26. (Currently Amended) The computing device of claim 24, wherein
2 each said per-packet type I completion line further comprises a checksum of the
3 corresponding packet.